WHAT IS CLAIMED IS:

1   1.   A field emission cathode comprising:

2   a)   a substrate; and

3   b)   a field emission cathode material comprising a mixture of carbon
4   nanotubes and particles.

1   2.   The cathode of claim 1, wherein the carbon nanotubes are selected from the
2   group consisting of single-wall carbon nanotubes, double-wall carbon nanotubes,
3   multi-wall carbon nanotubes, buckytubes, carbon fibrils, chemically-modified carbon
4   nanotubes, derivatized carbon nanotubes, metallic carbon nanotubes, semiconducting
5   carbon nanotubes, metallized carbon nanotubes, and combinations thereof.

1   3.   The cathode of claim 1, wherein the particles are selected from the group
2   consisting of spherical particles, disk-shaped particles, lamellar particles, rod-like
3   particles, metal particles, semiconductor particles, polymeric particles, ceramic
4   particles, dielectric particles, clay particles, fibers, nanoparticles, and combinations
5   thereof.

1   4.   The cathode of claim 1, wherein the cathode material resides on a surface of
2   the substrate as a layer.

1   5.   The cathode of claim 4, wherein the layer of cathode material has a thickness
2   which ranges from about 10 nm to about 1 mm.

1   6.   The cathode of claim 1, wherein nanotubes are present in the cathode material
2   in an amount which ranges from about 0.1 weight percent to about 99 weight percent.

1   7.   The cathode of claim 1, wherein the carbon nanotubes are aligned.

1   8.   The cathode of claim 1, wherein the carbon nanotubes have at least one end

2   trapped between particles.

3   9.   The cathode of claim 1, wherein the carbon nanotubes are trapped within pores

4   in the particles.

1   10.   The cathode of claim 1, wherein the carbon nanotubes are trapped within gaps

2   between the particles.

1   11.   The cathode of claim 1, wherein the particles are lamellar.

1   12.   The cathode of claim 11, wherein the CNTs are trapped between layers within

2   the particles.

1   13.   A field emission display device comprising:

2   a)   an anode assembly; and

3   b)   a cathode assembly, wherein the cathode assembly comprises:

4   1)   a substrate;

5   2)   an electrically conducting layer deposited on the substrate; and

6   3)   a field emission cathode material comprising carbon nanotubes
7   and particles deposited as a layer over the electrically conducting
8   layer.

1 14.   A method comprising the steps of:

2   a)   forming a mixture of carbon nanotubes and particles; and

3   b)   depositing a layer of the mixture of carbon nanotubes and particles
4   onto a substrate to form a cathode.

1 15.   The method of claim 14, wherein the nanotubes are selected from the group
2 consisting of single-wall carbon nanotubes, double-wall carbon nanotubes, multi-wall
3 carbon nanotubes, buckytubes, carbon fibrils, chemically-modified carbon nanotubes,
4 derivatized carbon nanotubes, metallic carbon nanotubes, semiconducting carbon
5 nanotubes, metallized carbon nanotubes, and combinations thereof.

1 16.   The method of claim 14, wherein the particles are selected from the group
2 consisting of spherical particles, disk-shaped particles, lamellar particles, rod-like
3 particles, metal particles, semiconductor particles, polymeric particles, ceramic
4 particles, dielectric particles, clay particles, fibers, nanoparticles, and combinations
5 thereof.

1 17.   The method of claim 14, wherein the step of forming a mixture of carbon
2 nanotubes and particles comprises a milling operation.

1 18.   The method of claim 14, wherein the step of forming a mixture of carbon
2 nanotubes and particles comprises solvent dispersal.

1 19.   The method of claim 14, wherein the mixture of carbon nanotubes and
2 particles is deposited using a method selected from the group consisting of spraying,
3 brushing, electrophoretic deposition, dipping, dispensing, screen printing, ink jet
4 printing, and combinations thereof.

1 20.   The method of claim 19, further comprising a step to remove the solvent from
2 the mixture after depositing the mixture on the substrate.

1   21.   The method of claim 14, further comprising a taping process to activate the
2   cathode.

1   22.   The method of claim 14, further comprising a method of aligning the carbon
2   nanotubes within the layer of carbon nanotubes and particles.

1   23.   The method of claim 14, wherein the particles are lamellar.

1   24.   The method of Claim 23, further comprising a method of aligning the carbon
2   nanotubes using a shear force applied to the mixture of the carbon nanotubes and
3   lamellar particles.

1   25.   The method of claim 23, wherein the lamellar particles comprise clay.